



About This Guide

This preface includes the following sections:

- [Document Objectives, page v](#)
- [Audience, page v](#)
- [Document Organization, page v](#)
- [Document Conventions, page vi](#)
- [Installation Warnings, page vi](#)
- [Obtaining Documentation and Submitting a Service Request, page x](#)

Document Objectives

This guide describes how to perform installation and maintenance procedures on the Cisco ASA 5505 Adaptive Security Appliance.

Audience

This guide is for network administrators who perform any of the following tasks:

- Managing network security
- Installing and configuring firewalls
- Managing default and static routes, and TCP and UDP services

Document Organization

This guide includes the following chapters and appendices:

- [Chapter 1, “Overview,”](#) describes the product overview, LEDs and memory requirements.
- [Chapter 2, “Preparing for Installation,”](#) describes the installation overview, safety recommendations, and general site requirements.
- [Chapter 3, “Installing the Cisco ASA 5505,”](#) describes how to connect the interface cables, and rack or wall mount the chassis .

- [Chapter 4, “Maintenance and Upgrade Procedures,”](#) describes the adaptive security appliance maintenance and upgrade procedures.
- [Appendix 1, “Cable Pinouts,”](#) describes the cable pinouts.

Document Conventions

Command descriptions use these conventions:

- Braces ({ }) indicate a required choice.
- Square brackets ([]) indicate optional elements.
- Vertical bars (|) separate alternative, mutually exclusive elements.
- **Boldface** indicates commands and keywords that are entered literally as shown.
- *Italics* indicate arguments for which you supply values.

Examples use these conventions:

- Examples depict screen displays and the command line in *screen* font.
- Information you need to enter in examples is shown in **boldface screen** font.
- Variables for which you must supply a value are shown in *italic screen* font.

Graphical user interface examples uses these conventions:

- **Boldface** indicates buttons and menu items.
- Selecting a menu item (or pane) is indicated by the following convention:
Choose **Start > Settings > Control Panel**.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Installation Warnings

Be sure to read the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* document that accompanied this device before installing the chassis. This document contains important safety information. This section includes the following warnings:

- [Power Supply Disconnection Warning, page vii](#)
- [Jewelry Removal Warning, page vii](#)
- [Wrist Strap Warning, page vii](#)
- [Work During Lightning Activity Warning, page vii](#)
- [Installation Instructions Warning, page vii](#)
- [Chassis Warning for Rack-Mounting and Servicing, page viii](#)
- [Short-Circuit Protection Warning, page viii](#)
- [SELV Circuit Warning, page viii](#)
- [Ground Conductor Warning, page viii](#)

- [Blank Faceplates and Cover Panels Warning](#), page viii
- [Product Disposal Warning](#), page viii
- [Short-Circuit Protection Warning](#), page ix
- [Compliance with Local and National Electrical Codes Warning](#), page ix
- [DC Power Connection Warning](#), page ix
- [AC Power Disconnection Warning](#), page ix
- [TN Power Warning](#), page ix
- [48 VDC Power System](#), page ix
- [Multiple Power Cord](#), page ix
- [Circuit Breaker \(15A\) Warning](#), page ix
- [Grounded Equipment Warning](#), page x
- [Safety Cover Requirement](#), page x
- [Faceplates and Cover Panel Requirement](#), page x

Power Supply Disconnection Warning



Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. Statement 12

Jewelry Removal Warning



Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

Wrist Strap Warning



During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

Work During Lightning Activity Warning



Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

Installation Instructions Warning



Read the installation instructions before connecting the system to the power source. Statement 1004

Chassis Warning for Rack-Mounting and Servicing



Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack. When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

Short-Circuit Protection Warning



Warning

This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

SELV Circuit Warning



Warning

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables. Statement 1021

Ground Conductor Warning



Warning

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

Blank Faceplates and Cover Panels Warning



Warning

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

Product Disposal Warning



Warning

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

Short-Circuit Protection Warning



Warning

This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045

Compliance with Local and National Electrical Codes Warning



Warning

Installation of the equipment must comply with local and national electrical codes. Statement 1074

DC Power Connection Warning



Warning

After wiring the DC power supply, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position. Statement 8

AC Power Disconnection Warning



Warning

Before working on a chassis or working near power supplies, unplug the power cord on AC units. Statement 246

TN Power Warning



Warning

The device is designed to work with TN power systems. Statement 19

48 VDC Power System



Warning

The customer 48 volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output. Statement 128

Multiple Power Cord



Warning

This unit has more than one power cord. To reduce the risk of electric shock when servicing a unit, disconnect the power cord of the power strip that the unit is plugged into. Statement 137

Circuit Breaker (15A) Warning



Warning

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors). Statement 13

Grounded Equipment Warning



Warning

This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use. Statement 39

Safety Cover Requirement



Warning

The safety cover is an integral part of the product. Do not operate the unit without the safety cover installed. Operating the unit without the cover in place will invalidate the safety approvals and pose a risk of fire and electrical hazards. Statement 117

Faceplates and Cover Panel Requirement



Warning

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 142

Where to Find Safety and Warning Information

For safety and warning information, see the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* document that accompanied the product. This document describes the international agency compliance and safety information for the Cisco ASA 5505 Adaptive Security Appliance. It also includes translations of the safety warnings.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.



CHAPTER 1

Overview

Read through the entire guide before beginning any of the procedures in this book.



Warning

Only trained and qualified personnel should install, replace, or service this equipment. Statement 49



Caution

Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* and follow proper safety procedures when performing these steps.

This chapter describes the product and the memory requirements and includes the following topics:

- [Product Overview, page 1-1](#)
- [Memory Requirements, page 1-3](#)

Product Overview

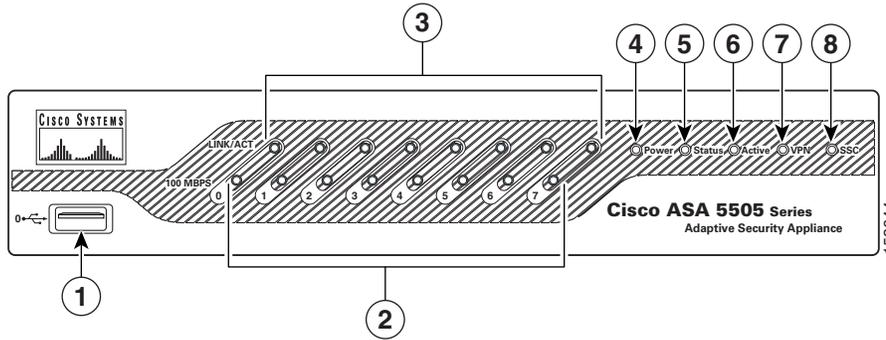
The Cisco ASA 5505 Adaptive Security Appliance delivers unprecedented levels of defense against threats to the network with deeper web inspection and flow-specific analysis, improved secure connectivity via end-point security posture validation, and voice and video over VPN support. It also provides enhanced support for intelligent information networks through improved network integration, resiliency, and scalability.

The adaptive security appliance software combines firewall, VPN concentrator, and intrusion prevention software functionality into one software image. Previously, these functions were available in three separate devices, each with its own software and hardware. Combining the functionality into just one software image provides significant improvements in the available features.

Additionally, the adaptive security appliance software supports Adaptive Security Device Manager (ASDM). ASDM is a browser-based, Java applet used to configure and monitor the software on the adaptive security appliances. ASDM is loaded from the adaptive adaptive security appliance, then used to configure, monitor, and manage the device.

This section describes the front and rear panels. [Figure 1-1](#) shows the front panel LEDs.

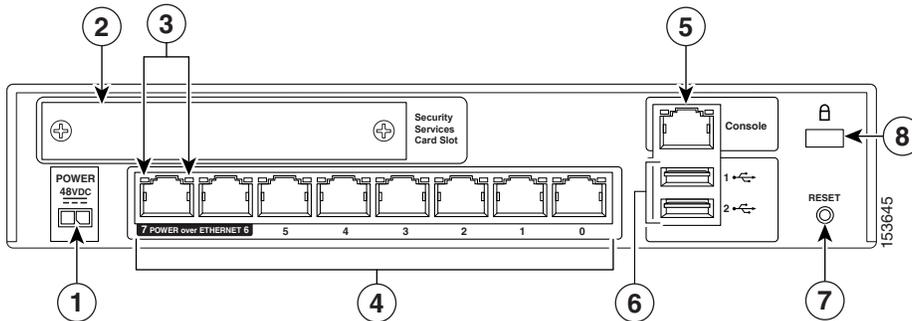
Figure 1-1 Front Panel LEDs and Ports



1	USB 2.0 interface	5	Status
2	100 Mbps	6	Active
3	LINK/ACT LEDs	7	VPN
4	Power	8	SSC

Figure 1-2 shows the rear panel LEDs and Ports.

Figure 1-2 Rear Panel LEDs and Ports (AC Power Supply Model Shown)



1	Power 48VDC	5	Console port
2	SSC slot	6	USB 2.0 interface
3	Network interface LEDs	7	Reset button
4	Network interfaces ¹	8	Lock slot

1. Ports 6 and 7 are 15-Watt output PoE ports, used for devices, such as IP phones, which can be powered by the network interface. They can also be used as regular Ethernet switch ports, just like the ports numbered 0 through 5.

Memory Requirements

The default DRAM memory is 256MB and the default internal flash memory is 128MB for the Cisco ASA 5505.

In a failover configuration, the two units must have the same hardware configuration. They must be the same model, have the same number and types of interfaces, and the same amount of RAM.

**Note**

The two units do not have to have the same size Flash memory. If using units with different Flash memory sizes in your failover configuration, make sure the unit with the smaller Flash memory has enough space to accommodate the software image files and the configuration files. If it does not, configuration synchronization from the unit with the larger Flash memory to the unit with the smaller Flash memory will fail.

For more information, see the *Cisco Security Appliance Command Line Configuration Guide*.

Memory Requirements for the Software Version 8.3 and Later

For information on memory requirements for the adaptive security appliance for software Version 8.3 or later, go to:

http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6032/ps6094/ps6120/product_bulletin_c25-586414.html



CHAPTER 2

Preparing for Installation

The information in this guide applies to the Cisco ASA 5505. In this guide, references to “adaptive security appliance” or security appliance apply to the Cisco ASA 5505 chassis unless specifically noted otherwise.

This chapter describes the steps to follow before installing new hardware or performing hardware upgrades, and includes the following sections:

- [Installation Overview, page 2-1](#)
- [Safety Recommendations, page 2-1](#)
- [General Site Requirements, page 2-3](#)

Installation Overview

To prepare for the installation of the chassis, perform the following steps:

-
- | | |
|---------------|--|
| Step 1 | Review the safety precautions outlined in the <i>Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series</i> document. |
| Step 2 | Read the release notes for the respective software version. |
| Step 3 | Unpack the chassis. An accessory kit ships with the chassis and includes the following items: documentation, a product CD, a power cord (AC models only), two RJ-45 Ethernet cables, one RJ-45 to DB-9 console cable, a rack-mounting kit, and four self-adhesive feet (for desktop mounting). |
| Step 4 | Place the chassis on a stable work surface. |
-

Safety Recommendations

Use the following guidelines and the information in the following sections to help ensure your safety and protect the adaptive security appliance. The list of guidelines may not address all potentially hazardous situations in your working environment, so be alert and exercise good judgement at all times.



Note

If you need to remove the chassis cover to install a hardware component, such as additional memory or an interface card, doing so does not affect your Cisco warranty. Upgrading the adaptive security appliance does not require any special tools and does not create any radio frequency leaks.

The safety guidelines are as follows:

- Keep the chassis area clear and dust-free before, during and after installation.
- Keep tools away from walk areas where you and others could fall over them.
- Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains, that could get caught in the chassis.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

This section includes the following topics:

- [Maintaining Safety with Electricity, page 2-2](#)
- [Preventing Electrostatic Discharge Damage, page 2-3](#)

Maintaining Safety with Electricity



Warning

Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units. Statement 12

Follow these guidelines when working on equipment powered by electricity:

- Before beginning procedures that require access to the interior of the chassis, locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected from a circuit; always check the circuit.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Disconnect power from the system.
 - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
 - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.
- Use the adaptive security appliance chassis within its marked electrical ratings and product usage instructions.
- Install the adaptive security appliance in compliance with local and national electrical codes as listed in the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* document.
- The adaptive security appliance models equipped with AC-input power supplies are shipped with a 3-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures.

- Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground ESD voltages. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

General Site Requirements

The topics in this section describe the requirements your site must meet for safe installation and operation of your system. Ensure that your site is properly prepared before beginning installation.

This section includes the following topics:

- [Site Environment, page 2-3](#)
- [Preventive Site Configuration, page 2-3](#)
- [Power Supply Considerations, page 2-4](#)
- [Configuring Equipment Racks, page 2-4](#)

Site Environment

Place the chassis on a desktop or mount it on a rack. The location of the chassis and the layout of the equipment rack or wiring room are extremely important for proper system operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause system malfunctions and shutdowns, and can make the chassis maintenance difficult.

For information on physical specifications, see table 7 at the following url:

http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6032/ps6094/ps6120/product_data_sheet0900aec802930c5.html.

When planning the site layout and equipment locations, keep in mind the precautions described in the next section “[Preventive Site Configuration, page 2-3](#),” to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns. If you are currently experiencing shutdowns or unusually high error rates with your existing equipment, these precautions may help you isolate the cause of failures and prevent future problems.

Preventive Site Configuration

The following precautions will help plan an acceptable operating environment for the chassis and avoid environmentally caused equipment failures:

- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Ensure that the room in which you operate your system has adequate air circulation.
- Always follow the ESD-prevention procedures described previously to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis top panel is secure. The chassis is designed to allow cooling air to flow effectively within it. An open chassis allows air leaks, which may interrupt and redirect the flow of cooling air from the internal components.

Power Supply Considerations

For information on power supply considerations including environmental operating ranges and power requirements, see table 7 at the following url:

http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6032/ps6094/ps6120/product_data_sheet0900aec802930c5.html

Observe the following considerations:

- Check the power at the site before installing the chassis to ensure that the power is “clean” (free of spikes and noise). Install a power conditioner if necessary, to ensure proper voltages and power levels in the source voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- In a chassis equipped with an AC-input power supply, use the following guidelines:
 - The chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct AC-input power requirement.
 - Several styles of AC-input power supply cords are available; make sure you have the correct style for your site.
 - Install an uninterruptible power source for your site, if possible.
 - Install proper site grounding facilities to guard against damage from lightning or power surges.

Configuring Equipment Racks

For information on physical specifications, see table 7 at the following url:

http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6032/ps6094/ps6120/product_data_sheet0900aec802930c5.html



CHAPTER 3

Installing the Cisco ASA 5505

Installing the Chassis

This section contains the following topics:

- [Connecting the Interface Cables, page 3-1](#)
- [Powering on the Cisco ASA 5505, page 3-3](#)
- [Installing a Cable Lock, page 3-4](#)
- [Rack or Wall Mounting the Cisco ASA 5505, page 3-4](#)

Connecting the Interface Cables

This section describes how to connect the cables to the Ethernet and Console ports.



Warning

Only trained and qualified personnel should install, replace, or service this equipment. Statement 49



Caution

Read the safety warnings in the *Regulatory Compliance and Safety Information for the Cisco ASA 5505 Adaptive Security Appliance* and follow proper safety procedures when performing these steps.

To connect cables to the ports perform the following steps:

-
- Step 1** Place the chassis on a flat, stable surface.
 - Step 2** Before connecting a computer or terminal to the ports, check to determine the baud rate of the serial port. The baud rate must match the default baud rate (9600 baud) of the Console port of the adaptive security appliance. Set up the terminal as follows: 9600 baud (default), 8 data bits, no parity, 1 stop bits, and Flow Control (FC) = Hardware.
 - Step 3** Connect the cables to the ports.

a. Ethernet ports

Step 1 Connect Port 0, the outside Ethernet port, to the public network, that is, the Internet:

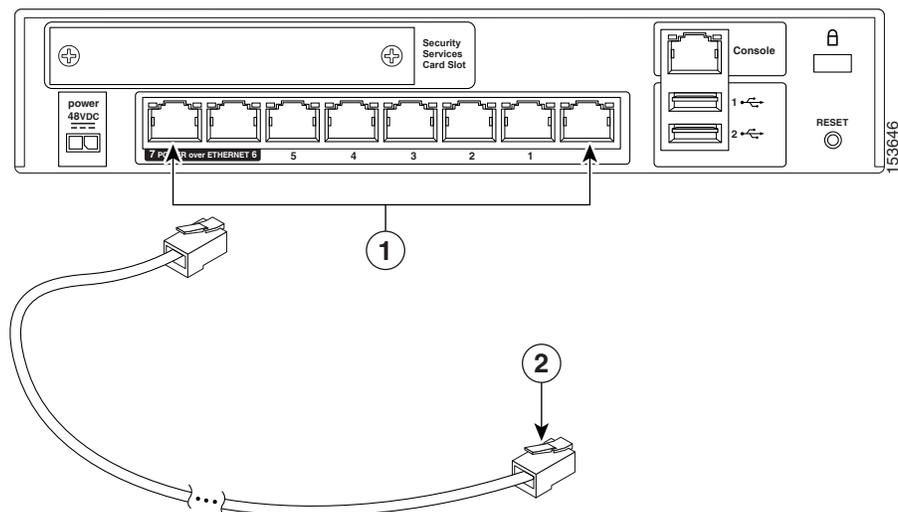


Note By default, switch port 0/0 is the outside port. If needed you can change the inside and outside ports assignments later.

Step 2 Connect your network devices with an Ethernet cable to one of the inside ports (numbered 1 through 7).
If you are connecting any PoE devices, connect them to one of the switch ports that support PoE (ports numbered 6 and 7).

Step 3 Check the LINK LED to verify that the network devices have basic connectivity to the Cisco ASA 5505 on one of the inside ports (numbered 0 through 7). When connectivity is established, the LINK LED on the front panel of the Cisco ASA 5505 lights up solid green.

Figure 3-1 Connecting Cables to Network Interfaces



1	RJ-45 Ethernet ports	2	RJ-45 connector
---	----------------------	---	-----------------

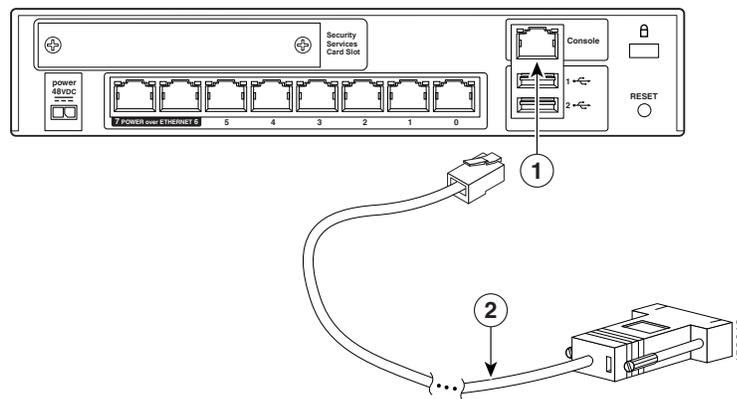
Step 4 Connect the power cord to the adaptive security appliance and plug the other end to the power source. For information on powering on the chassis, see the [“Powering on the Cisco ASA 5505”](#) section on page 3-3

b. Console port

You can access the command line for administration using the console port on the Cisco ASA 5505. To connect to the console port and run a serial terminal emulator on a PC or workstation, perform the following steps:

-
- Step 1** Plug one end of the PC terminal adapter into a standard 9-pin PC serial port on your PC.
- Step 2** Plug one end of the blue console cable into the PC terminal adapter.
- Step 3** Plug the other end of the blue console cable into the Console port.
- Step 4** Configure the PC terminal emulation software or terminal for 9600 baud, 8 data bits, no parity, and 1 stop bit.
-

Figure 3-2 Connecting to the Console Cable



1	RJ-45 Console port	2	RJ-45 to DB-9 console cable
----------	--------------------	----------	-----------------------------

Powering on the Cisco ASA 5505

To power on the Cisco ASA 5505, perform the following steps:

-
- Step 1** Connect the power supply with the power cable.
- Step 2** Connect the small, rectangular connector of the power supply cable to the power connector on the rear.
- Step 3** Connect the AC power connector of the power supply input cable to an electrical outlet.



Note The Cisco ASA 5505 does not have a power switch. Completing Step 3 powers on the device.

- Step 4** Check the power LED; if it is solid green, then the device is powered on.



Note The light will be solid green, only for 100Mbps devices.

Installing a Cable Lock

The Cisco ASA 5505 includes a slot that accepts standard desktop cable locks to provide physical security. The cable lock is not included.

To install a cable lock, perform the following steps:

-
- Step 1** Follow the directions from the manufacturer for attaching the other end of the cable for securing the Cisco ASA 5505.
- Step 2** Attach the cable lock to the lock slot on the back panel of the Cisco ASA 5505.
-

Rack or Wall Mounting the Cisco ASA 5505



Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety: This unit should be mounted at the bottom of the rack if it is the only unit in the rack. When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

The following information can help plan equipment rack installation:

- Allow clearance around the rack for maintenance.
- If the rack contains stabilizing devices, install the stabilizers prior to mounting or servicing the unit in the rack.
- When mounting a device in an enclosed rack, ensure adequate ventilation. Do not overcrowd an enclosed rack. Make sure that the rack is not congested, because each unit generates heat.
- When mounting a device in an open rack, make sure that the rack frame does not block the intake or exhaust ports.
- If the rack contains only one unit, mount the unit at the bottom of the rack.
- If the rack is partially filled, load the rack from the bottom to the top, with the heaviest component at the bottom of the rack.

This section contains the following topics:

- [Mounting the Chassis, page 3-5](#)
- [Installing and Wall-Mounting the Cisco ASA 5505 FIPS Enclosure, page 3-11](#)

Mounting the Chassis

You can wall-mount or rack-mount the adaptive security appliance. The part number for ordering a wall-mount kit for the adaptive security appliance is ASA-5505-WALL-MNT= , the part number for ordering a rack-mount kit for the adaptive security appliance is ASA5505-RACK-MNT= . This section includes the following topics:

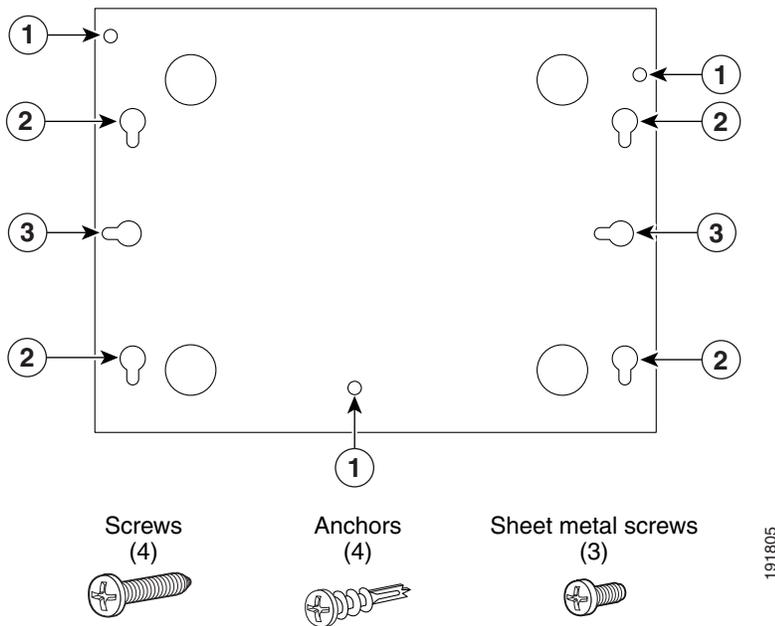
- [Wall-Mounting the Chassis, page 3-5](#)
- [Rack-Mounting the Chassis, page 3-7](#)

Wall-Mounting the Chassis

To wall-mount the chassis, perform the following steps:

- Step 1** Choose a wall where you would like to mount the adaptive security appliance.
- Step 2** Using the wall-mounting bracket as a template, use a pencil to mark the location for the four plastic anchors, used to secure the adaptive security appliance to the wall. Make sure all the pencil marks are located in the center as shown in [Figure 3-10](#).

Figure 3-3 Wall-Mounting Bracket

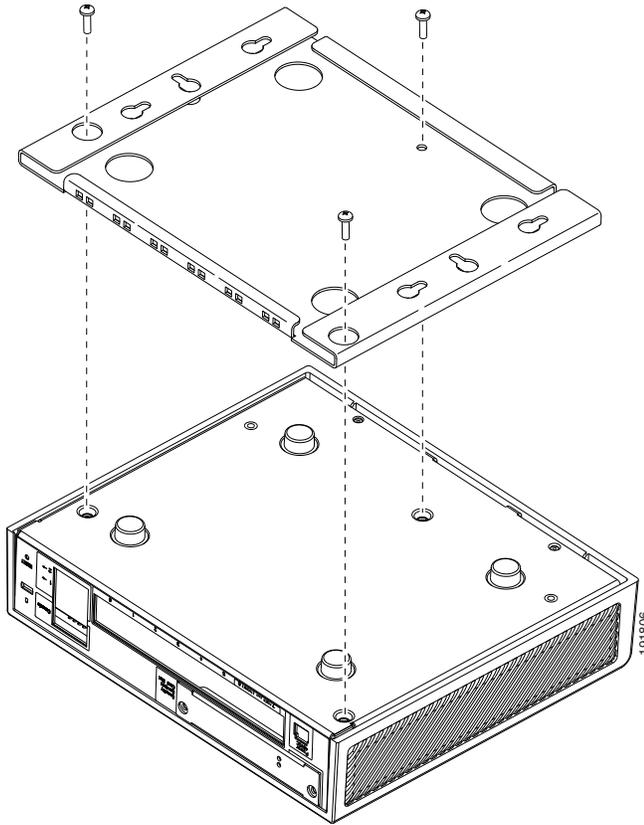


1	M3 x 12 screws	3	Plastic anchors for vertical mounting (optional)
2	Plastic anchors		

- Step 3** Drill a hole on the wall at each mark you made for the location for the plastic anchors.
- Step 4** Press the four plastic anchors into the holes.
- Step 5** Screw the four screws provided in the accessory kit into the anchors, but not all the way. Allow them to protrude about 1/8-inch (0.317 cm).

- Step 6** Remove the three screws from the bottom of the adaptive security appliance as shown in [Figure 3-13](#). Discard these screws as you will not need them.
- Step 7** Place the wall-mount bracket on the adaptive security appliance. Use the three screws provided in the accessory kit to screw the wall-mount bracket to the adaptive security appliance as shown in [Figure 3-13](#).

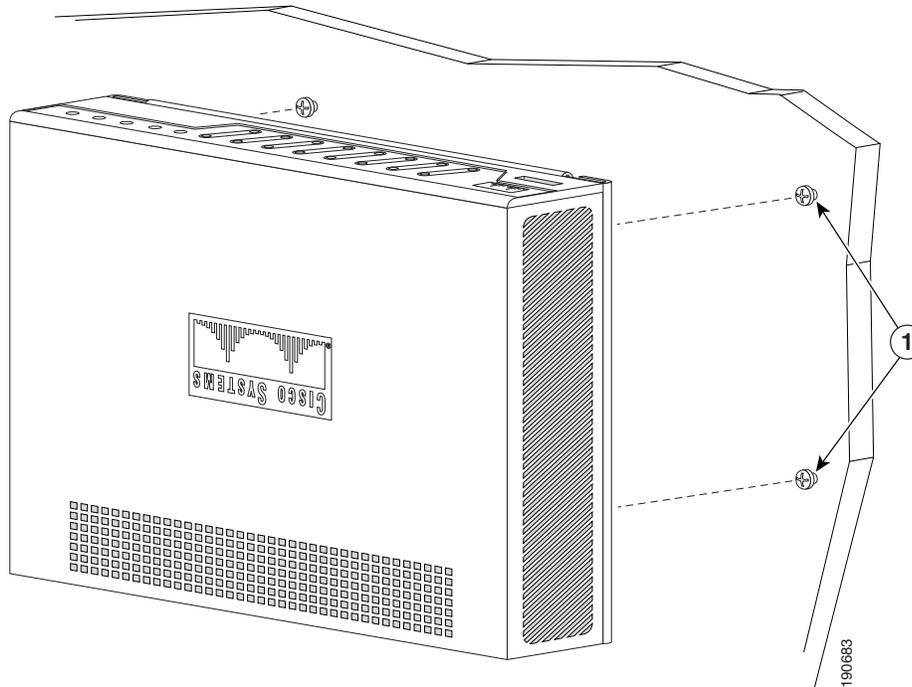
Figure 3-4 Removing and Replacing the Screws



- Step 8** Pick up the adaptive security appliance with the wall-mount bracket facing the wall, align the screws in the anchors with the holes in the brackets.

- Step 9** Allowing the screws in the anchors to go through the holes in the brackets, mount and slide down the adaptive security appliance.

Figure 3-5 Mounting the Cisco ASA 5505 Chassis



1	Screws
----------	--------

- Step 10** Connect the interface cables.
For information on installing the cables, see the [“Connecting the Interface Cables”](#) section.

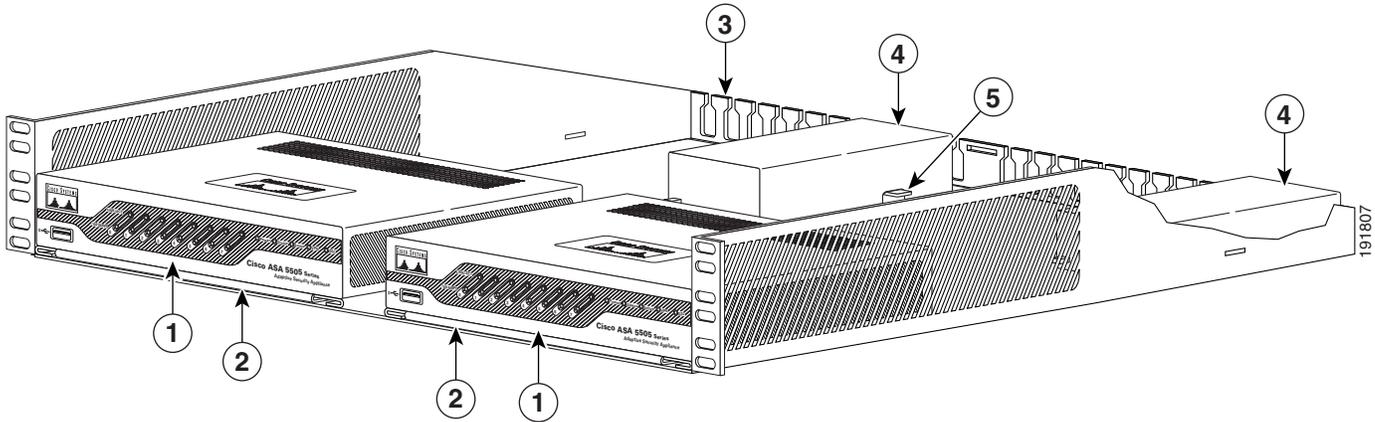
Rack-Mounting the Chassis

To rack-mount the adaptive security appliance chassis, perform the following steps:

- Step 1** Remove the three screws from the bottom of the adaptive security appliance as shown in [Figure 3-13](#). Discard these screws as you will not need them.
- Step 2** Place the wall-mount bracket on the adaptive security appliance. Use the three screws provided in the accessory kit to screw the wall-mount bracket to the adaptive security appliance as shown in [Figure 3-13](#).

- Step 3** Place the wall-mount bracket with the adaptive security appliance attached to it on the rack mount tray as shown in [Figure 3-6](#).

Figure 3-6 Placing the Device on the Rack Mount Tray

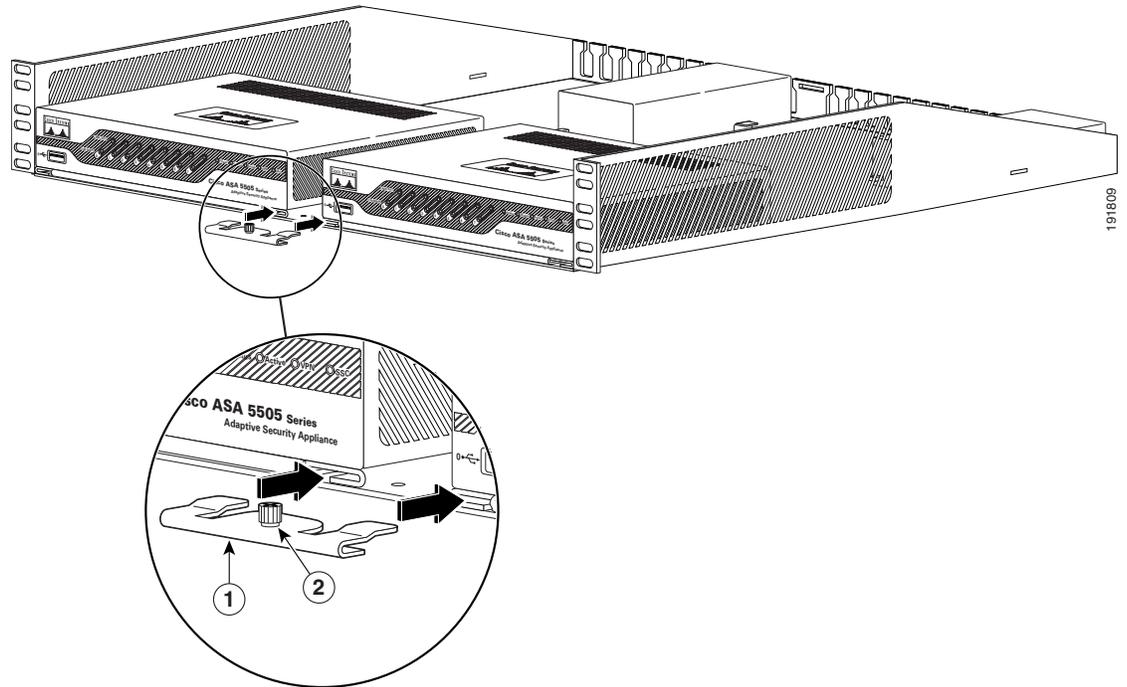


1	Wall-mount bracket	2	Cisco ASA 5505 chassis	5	Velcro
3	Cable manager	4	Power supply		

- Step 4** Place the power supply adapter on the rack-mount tray and use the velcro provided to hold it in place as shown in [Figure 3-6](#).

Step 5 Screw in the security bracket to the front of the rack mount as shown in [Figure 3-7](#), to hold it in place.

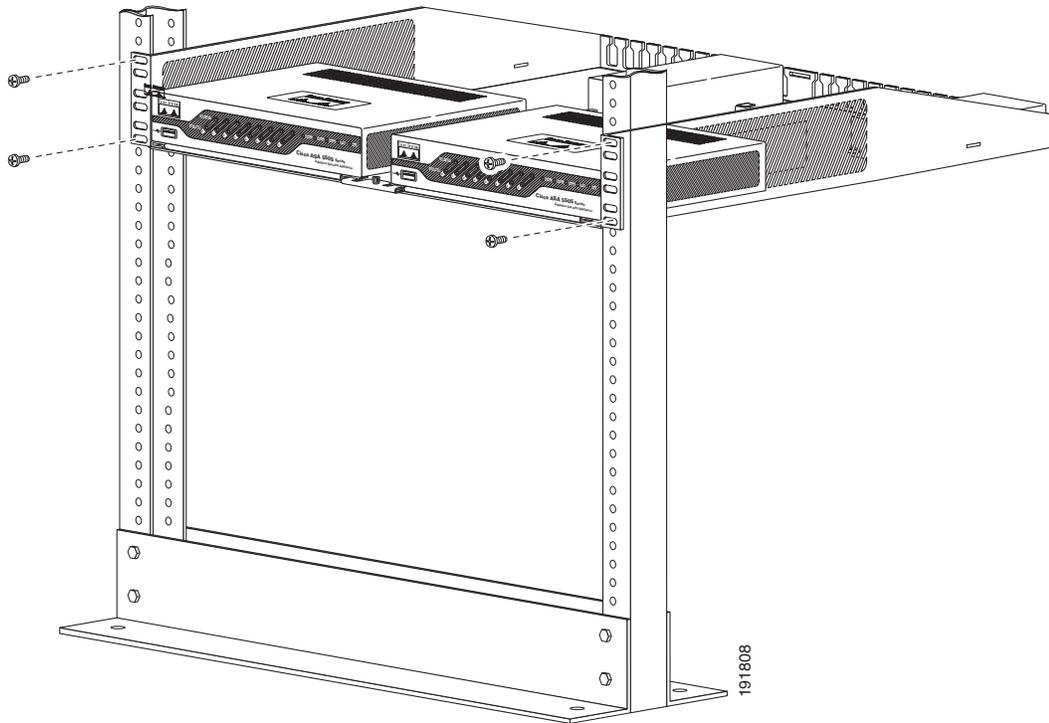
Figure 3-7 Attaching the Security Bracket



1	Security bracket	2	Screw
----------	------------------	----------	-------

Step 6 Attach the rack-mount tray to the rack using the supplied screws, as shown in [Figure 3-8](#).

Figure 3-8 Attaching the Rack Mount Tray to the Rack

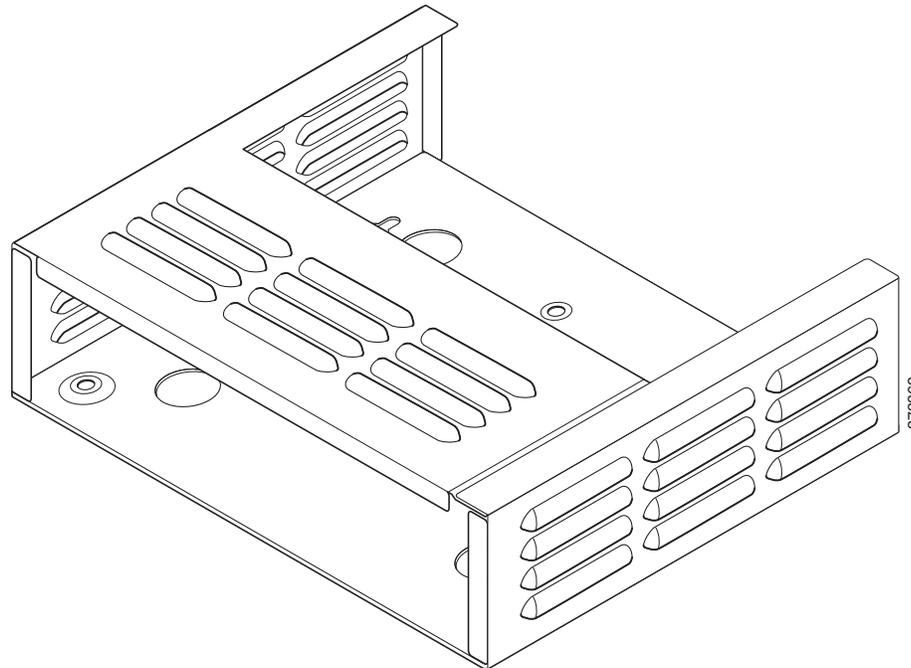


To remove the chassis from the rack, remove the screws that attach the chassis to the rack, and then remove the chassis.

Installing and Wall-Mounting the Cisco ASA 5505 FIPS Enclosure

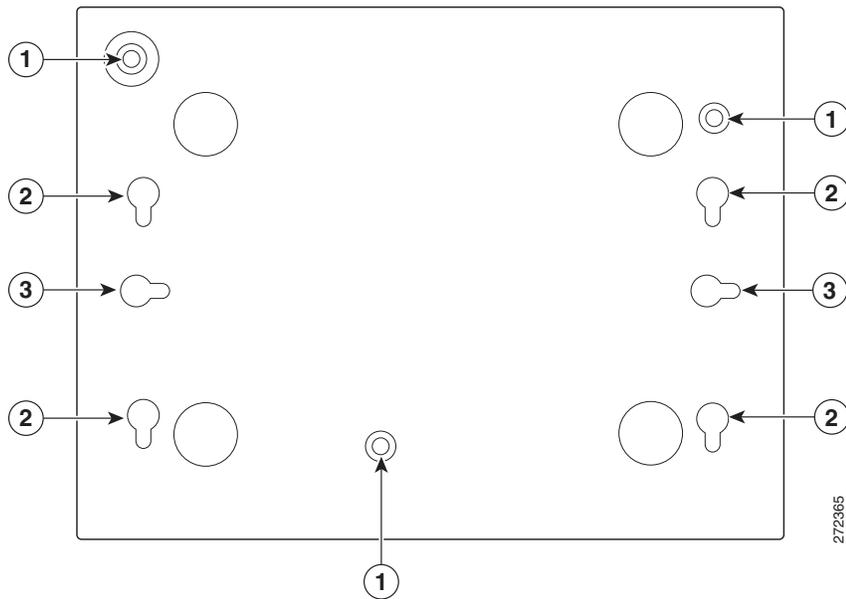
Figure 3-9 shows the FIPS enclosure for the Cisco ASA 5505.

Figure 3-9 FIPS Enclosure



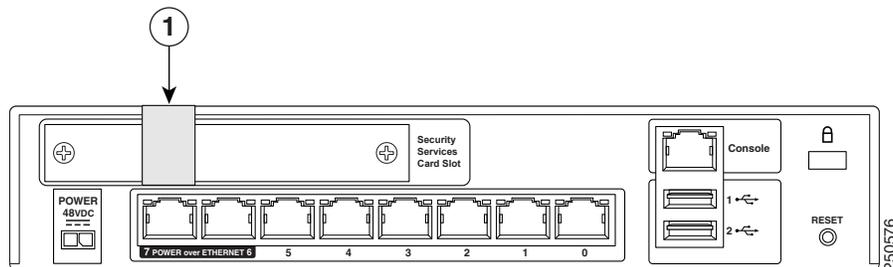
To install and wall-mount the Cisco ASA 5505 FIPS enclosure, perform the following steps:

-
- Step 1** Choose a wall where you would like to mount the Cisco ASA 5505.
 - Step 2** Using the FIPS enclosure as a template, use a pencil to mark the location for the four plastic anchors, used to secure the adaptive security appliance to the wall. Make sure all the pencil marks are located in the center as shown in [Figure 3-10](#).

Figure 3-10 Bottom View of the FIPS Enclosure

1	M3 x 12 screws	3	Plastic anchors for vertical mounting (optional)
2	Plastic anchors		

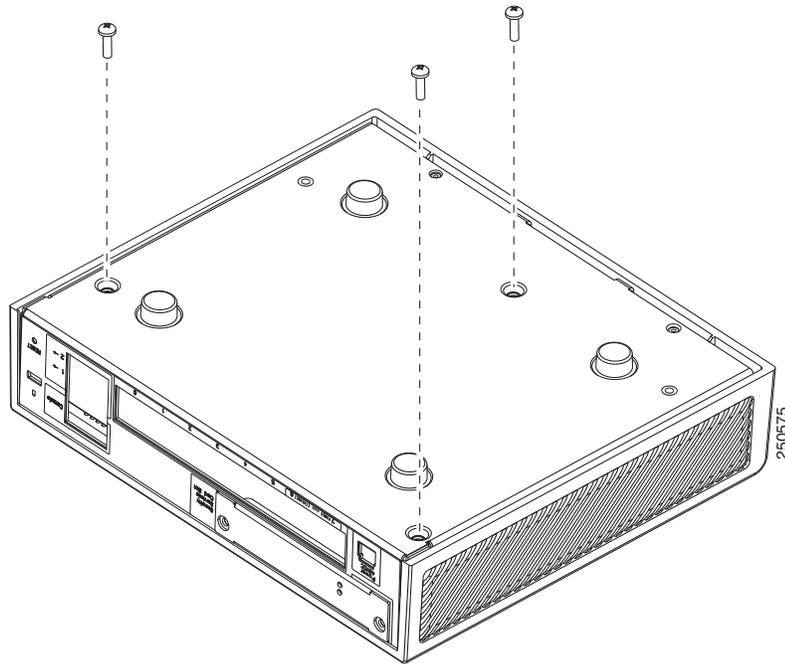
- Step 3** Drill a hole on the wall at each mark you made for the location for the plastic anchors.
- Step 4** Press the four plastic anchors into the holes.
- Step 5** Screw the four screws provided in the accessory kit into the anchors, but not all the way. Allow them to protrude about 1/8-inch (0.317 cm).
- You must apply three tamper evident labels. Tamper evident labels are included in the FIPS kit, Cisco-FIPS-KIT=. Clean the chassis of any grease, dirt, or oil before applying the tamper evident labels. Alcohol-based cleaning pads are recommended for this purpose.
- Step 6** Apply the first tamper evident label as shown in [Figure 3-11](#).

Figure 3-11 Cisco ASA 5505 Tamper Evident Label Placement

1	Tamper label
---	--------------

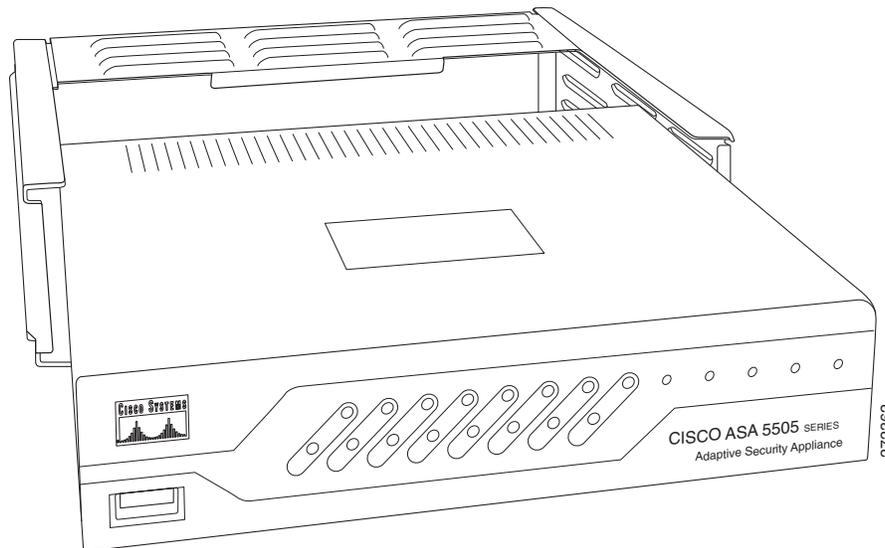
- Step 7** Remove the three screws from the bottom of the Cisco ASA 5505 as shown in [Figure 3-12](#).

Figure 3-12 Removing the Screws

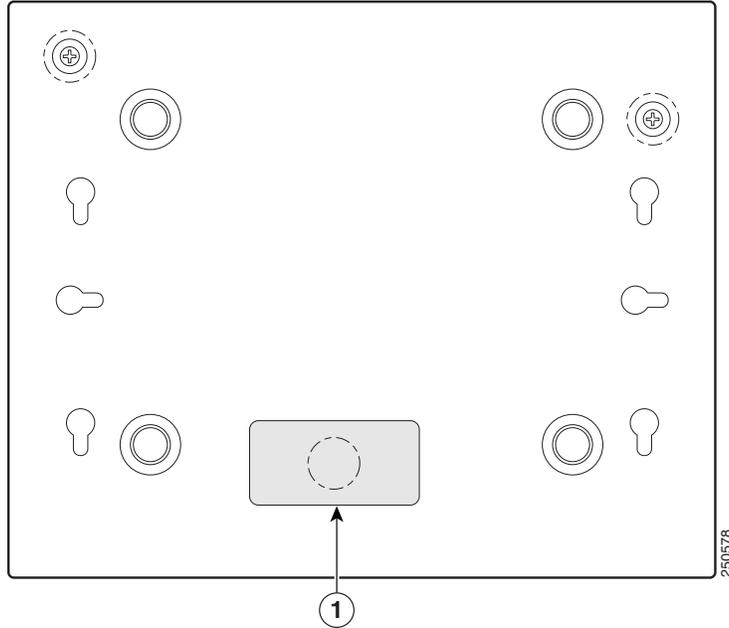


- Step 8** Slide the ASA 5540 into the FIPS enclosure as shown in [Figure 3-13](#).

Figure 3-13 Sliding the Cisco ASA 5505 Chassis into the FIPS Enclosure

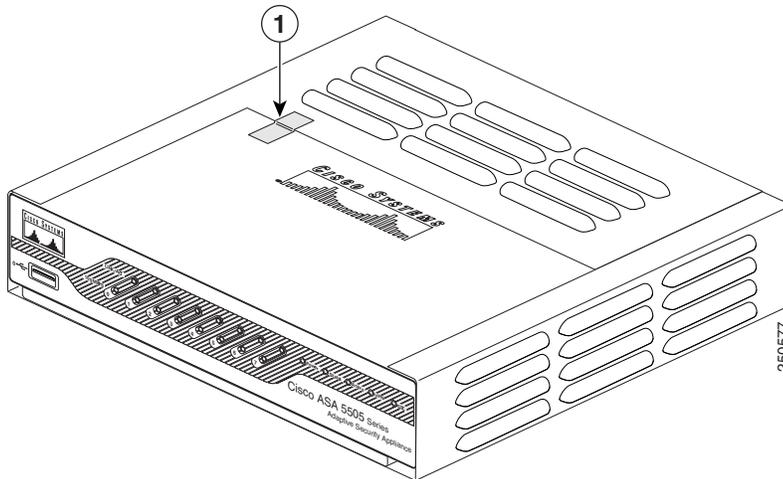


- Step 9** Turn the FIPS enclosure with the chassis securely inside and use the three screws you removed in Step 6 to screw the FIPS enclosure to the Cisco ASA 5505.
- Step 10** Apply the second tamper evident label over the screw as shown in [Figure 3-14](#).

Figure 3-14 Tamper Evident Label Applied Over the Screw

1	Tamper label
----------	--------------

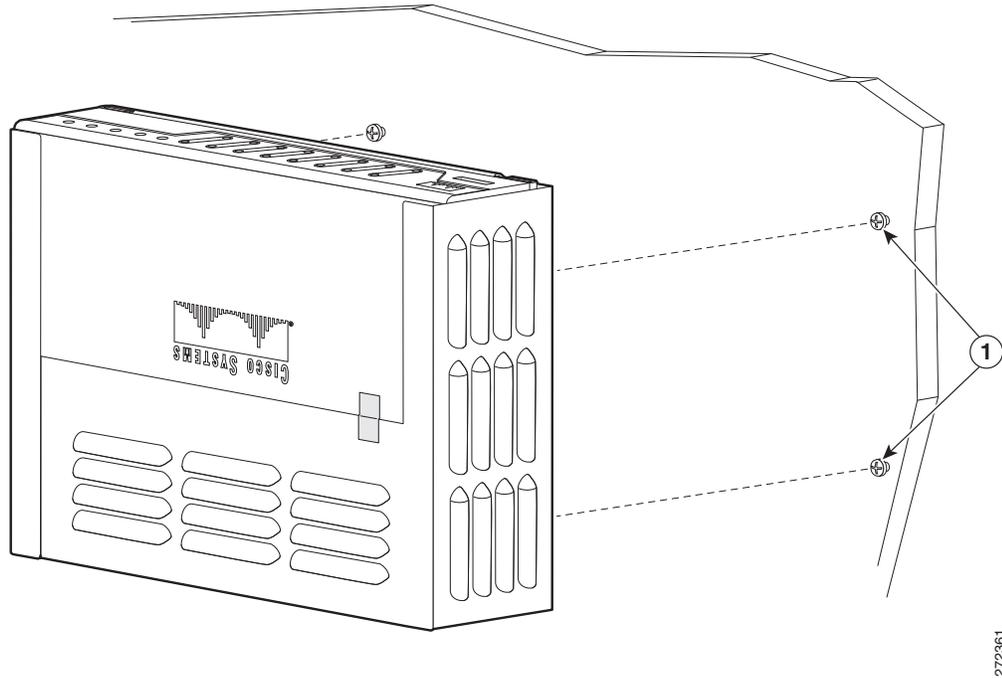
Step 11 The third tamper evident label should be placed so that the one half of the tamper evident label covers the enclosure and the other half covers the Cisco ASA 5505 chassis as shown in [Figure 3-15](#).

Figure 3-15 Tamper Evident Label Applied Over the Chassis and the FIPS Enclosure

1	Tamper label
----------	--------------

- Step 12** Pick up the Cisco ASA 5505 with the FIPS enclosure facing the wall, align the screws in the anchors with the holes in the enclosure.
- Step 13** Allowing the screws in the anchors to go through the holes in the enclosure, mount and slide down the Cisco ASA 5505 as shown in [Figure 3-16](#).

Figure 3-16 Mounting the Cisco ASA 5505 Chassis



272361

1	Screws
----------	--------

- Step 14** Connect the interface cables.
For information on installing the cables, see the [“Connecting the Interface Cables”](#) section.



CHAPTER 4

Maintenance and Upgrade Procedures

This chapter describes how to install the chassis on the wall or rack, remove and replace the chassis cover, the power supply, and the CompactFlash. This chapter includes the following sections:

- [Removing and Replacing the Chassis Cover, page 4-1](#)
- [Replacing the Lithium Battery, page 4-3](#)
- [Setting the Clock and Time Zone After Replacing the Battery, page 4-4](#)
- [Installing and Replacing the SSC, page 4-6](#)
- [Upgrading Memory, page 4-7](#)

Removing and Replacing the Chassis Cover

This section describes how to remove and replace the chassis cover. This section includes the following topics:

- [Working in an ESD Environment, page 4-1](#)
- [Removing the Chassis Cover, page 4-2](#)
- [Replacing the Chassis Cover, page 4-3](#)

Working in an ESD Environment

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Always follow ESD-prevention procedures when you remove and replace components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground unwanted ESD voltages. To guard against ESD damage and shocks, the wrist strap and cord must operate properly. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Removing the Chassis Cover

To remove the chassis cover, perform the following steps:



Note

Removing the chassis cover does not affect Cisco warranty. Upgrading the adaptive security appliance does not require any special tools and does not create any radio frequency leaks.

Step 1 Read the *Regulatory Compliance and Safety Information for the Cisco ASA 5500 Series* document.

Step 2 Power off the adaptive security appliance.



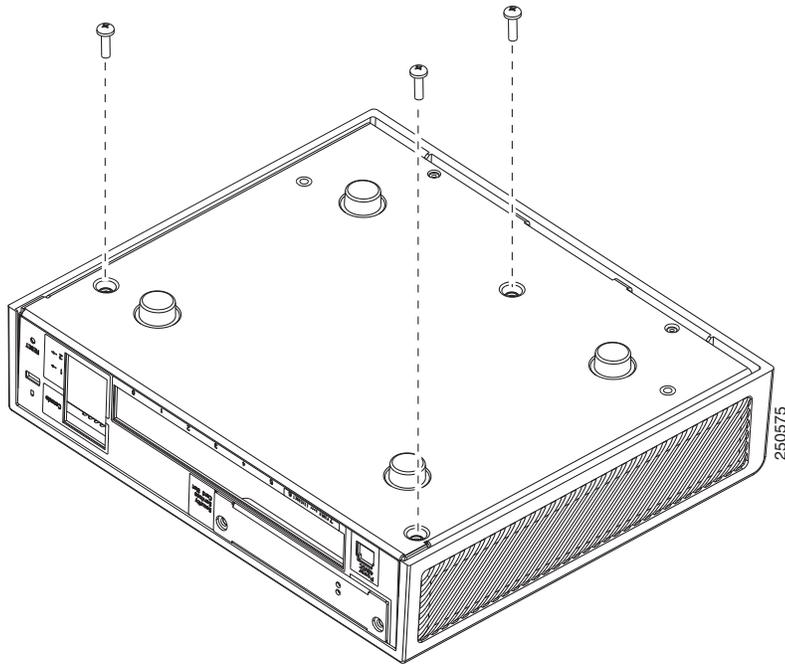
Warning

Before working on a system that has an On/Off switch, turn OFF the power and unplug the power cord.
Statement 1

Step 3 Turn the chassis upside down so that the top of the chassis is resting on a flat surface, and the front of the chassis is facing toward you.

Step 4 Remove the three screws located on the bottom of the chassis as shown in [Figure 4-1](#).

Figure 4-1 Removing the Screws



Step 5 Return the chassis to the upright position. Note that the chassis is comprised of two sections: top and bottom.

Step 6 Hold both sides of the top section, at the base of the appliance in the rear and pull outward while gently lifting upward.

Replacing the Chassis Cover

**Caution**

Do not operate the adaptive security appliance without the chassis cover installed. The chassis cover protects the internal components, prevents electrical shorts, and provides proper air-flow for cooling the electronic components.

To replace the chassis cover on the adaptive security appliance, perform the following steps:

-
- Step 1** Place the chassis on a secure surface with the front panel facing you.
 - Step 2** Hold the chassis cover so that the rear of the chassis cover are aligned with the chassis bottom.
 - Step 3** Lower the front of the cover onto the chassis, making sure that the side tabs of the cover fit under the side panels of the chassis.
 - Step 4** Slide the chassis cover toward the front, making sure that the cover tabs fit under the back panel, and the back panel tabs fit under the chassis cover.
 - Step 5** Secure the chassis cover with the screw you set aside earlier.
 - Step 6** Reconnect the network interface cables.
 - Step 7** Reconnect the power cord to the power outlet to power on the adaptive security appliance.
-

Replacing the Lithium Battery

This section describes how to remove and replace the lithium battery in the adaptive security appliance. The lithium battery is a field-replaceable unit (FRU).

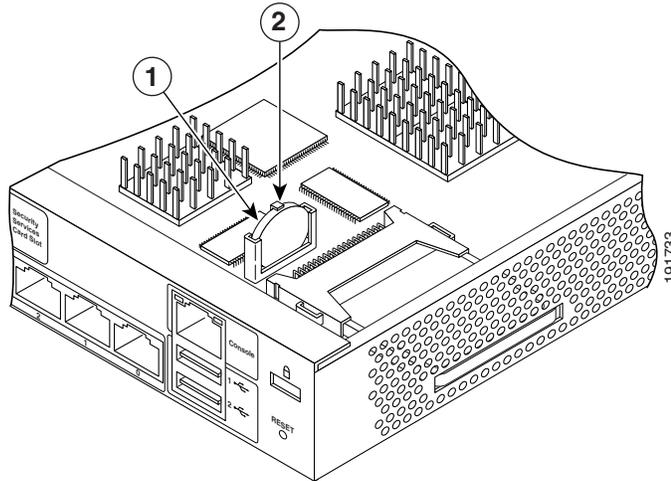
**Warning**

Danger of explosion exists if the lithium battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Statement 33

To remove and replace the battery in the adaptive security appliance, perform the following steps:

-
- Step 1** Remove the chassis cover as described in the [“Removing the Chassis Cover”](#) section on page 4-2.
 - Step 2** Slide the metal clip back and pull the battery out.

Figure 4-2 Cisco ASA 5505 Lithium Battery Location



1	Battery	2	Metal clip
---	---------	---	------------

- Step 3** Place the used battery aside.
- Step 4** Replace the battery with a compatible Lithium CR-2032 battery (which is available at your local electronics or drug store), by sliding the metal clip back and sliding the battery into place.
- Step 5** Replace the chassis cover as described in the [“Replacing the Chassis Cover”](#) section on page 4-3.

Setting the Clock and Time Zone After Replacing the Battery

After replacing the battery on the ASA 5505, you might have to set the clock twice so that it remains set to the correct time. You only need to configure the time zone setting once for the ASA 5505 to save the correct time zone.

To successfully set the clock and time zone, perform the following steps:

- Step 1** Power up the ASA 5505 and allow it to complete the boot process.

- Step 2** Enter privileged EXEC mode:

```
hostname> enable
Password: <password>
hostname#
```

- Step 3** Verify that the clock is set to the default:

```
hostname# show clock
00:04:17.329 UTC Tue Jan 1 2008
hostname#
```

- Step 4** Enter global configuration mode:

```
hostname# configure terminal
hostname(config)#
```

- Step 5** Set the time zone for your location:

```
hostname(config)# clock timezone EST -5 0
```

```
hostname(config)# end  
hostname#
```

Step 6 Set the date and time:

```
hostname# clock set 13:28:00 5 AUG 2016  
hostname#
```

Step 7 Save the new time and time zone to memory:

```
hostname# wr mem  
Building configuration...  
Cryptochecksum: bf1bf06d dd6daa27 60b40f81 3d3b0056  
  
2997 bytes copied in 1.30 secs (2997 bytes/sec)  
[OK]  
hostname#
```

Step 8 Reboot the adaptive security appliance:

```
hostname# reload  
Proceed with reload? [confirm]  
hostname#
```

Step 9 After the adaptive security appliance boots up, return to privileged EXEC mode:

```
hostname> en  
Password: <password>  
hostname#
```

Step 10 Verify that the time is correct:

```
hostname# show clock  
13:31:11.289 EST Fri Aug 5 2016  
hostname#
```

Step 11 If the adaptive security appliance does not display the correct time, enter the correct time again:

```
hostname# clock set 13:34:00 5 AUG 2016  
hostname#
```

Step 12 Save your change to memory:

```
hostname# wr mem  
Building configuration...  
Cryptochecksum: bf1bf06d dd6daa27 60b40f81 3d3b0056  
  
2997 bytes copied in 1.70 secs (2997 bytes/sec)  
[OK]  
hostname#
```

Step 13 Reboot:

```
hostname# reload  
Proceed with reload? [confirm]  
hostname#
```

Step 14 Verify that the clock setting is correct for your location:

```
hostname# show clock  
13:37:55.709 EST Fri Aug 5 2016  
hostname#
```

Installing and Replacing the SSC

This section describes how to install and replace the Security Services Card (SSC). This section includes the following topics:

- [Installing an SSC, page 4-6](#)
- [Replacing an SSC, page 4-7](#)

Figure 4-3 lists the SSC LEDs.

Figure 4-3 SSC LEDs

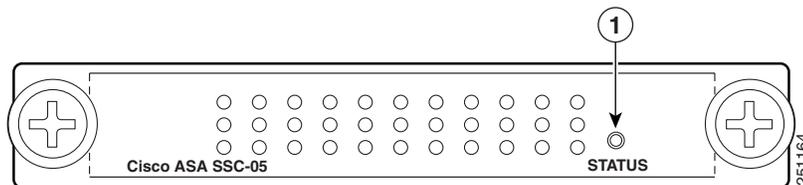


Table 4-1 describes the SSC LEDs.

Table 4-1 SSC LEDs

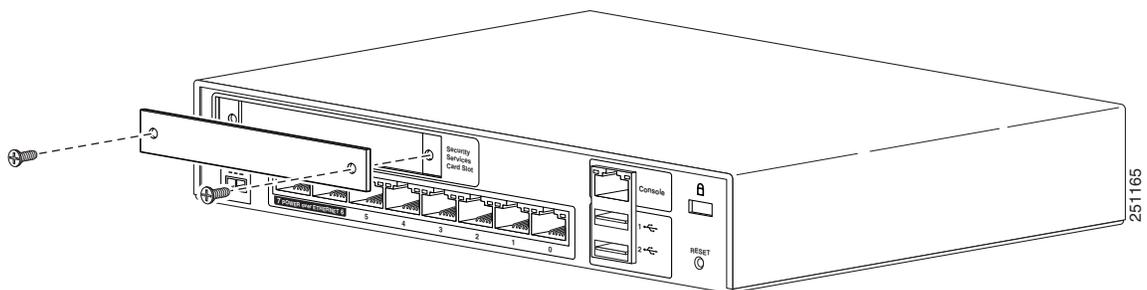
	LED	Color	State	Description
1	STATUS	Green	Flashing	The system is booting.
			Solid	The system has passed power-up diagnostics.

Installing an SSC

To install a new SSC for the first time, perform the following steps:

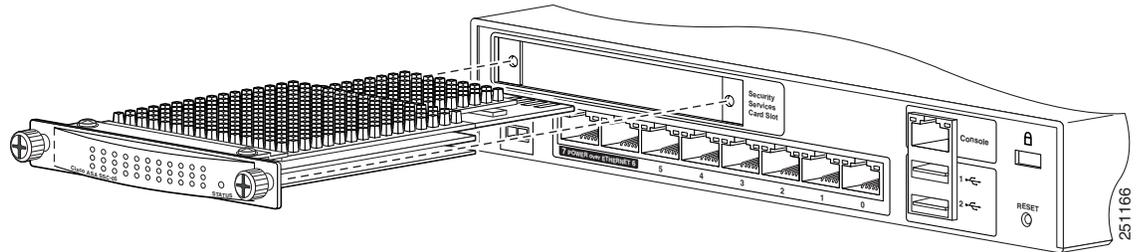
- Step 1** Power off the adaptive security appliance.
- Step 2** Locate the grounding strap from the accessory kit and fasten it to your wrist so that it contacts your bare skin. Attach the other end to the chassis.
- Step 3** Remove the two screws (as shown in [Figure 4-4](#)) at the left rear end of the chassis, and remove the slot cover.

Figure 4-4 Removing the Screws from the Slot Cover



- Step 4** Insert the SSC into the slot opening as shown in [Figure 4-5](#).

Figure 4-5 Inserting the SSC into the Slot



- Step 5** Attach the screws to secure the SSC to the chassis.
- Step 6** Power on the adaptive security appliance.
- Step 7** Check the LEDs. If the SSC is installed properly the STATUS LED flashes green.
- Step 8** Connect one end of the RJ-45 cable to the port and the other end of the cable to your network devices.

Replacing an SSC

To replace an existing SSC, perform the following steps:

- Step 1** Enter the **hw-mod mod 1 shut** command in privileged EXEC mode. Verify if the module is down by checking the LEDs.
- Step 2** Locate the grounding strap from the accessory kit and fasten it to your wrist so that it contacts your bare skin. Attach the other end to the chassis.
- Step 3** Remove the two screws (as shown in [Figure 4-4](#)) at the left rear end of the chassis.
- Step 4** Remove the SSC. Set it aside.
- Step 5** Replace the existing card by inserting the new SSC through the slot opening as shown in [Figure 4-5](#).
- Step 6** Attach the screws to secure the SSC to the chassis.
- Step 7** Enter the **hw-mod mod 1 reset** command in privileged EXEC mode to reset the SSC.
- Step 8** Check the LEDs. If the SSC is installed properly, the STATUS LED flashes green.
- Step 9** Connect one end of the RJ-45 cable to the port and the other end of the cable to your network devices.

Upgrading Memory

The memory upgrade kit, ASA5505-MEM-512=, allows you to upgrade the Cisco ASA 5505 to 512 MB of memory. To determine how much memory your adaptive security appliance has, use the **show version** command:

```
hostname# show version
```

```
Cisco Adaptive Security Appliance Software Version 8.0(0)
Device Manager Version 6.0(0)
```

```
Compiled on Mon 16-April-07 03:29 by root
```

```
System image file is "disk0:/cdisk.bin"
Config file at boot was "disk0:/main_backup.cfg"
```

```
hostname up 2 days 10 hours
failover cluster up 2 days 11 hours
```

Hardware: ASA5505, 256 MB RAM, CPU Pentium 4 Celeron 2000 MHz
BIOS Flash M50FW016 @ 0xfe00000, 2048KB

Table 2 lists the memory for the Cisco ASA 5505.

Table 2 Memory Upgrade

Model	Current Memory	Upgrade to
Cisco ASA 5505	256 MB	512 MB

This section describes how to remove and install the memory module on the adaptive security appliance. This section includes the following topics:

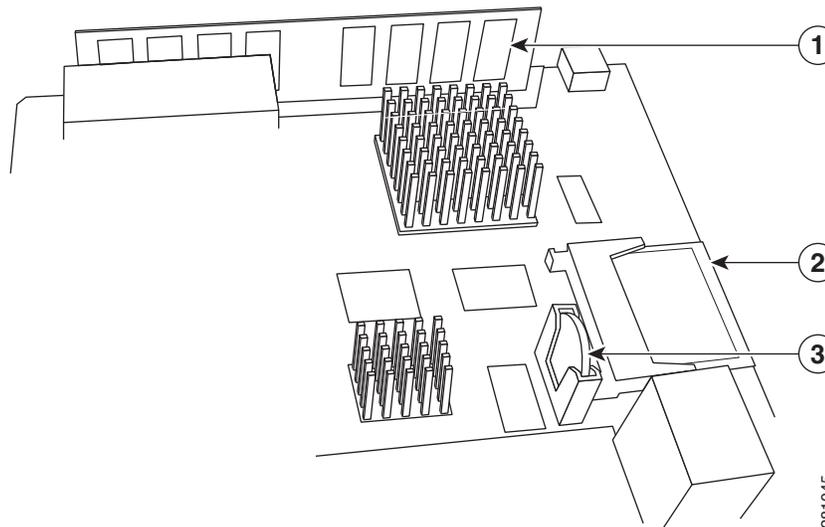
- [Removing the DIMM, page 4-8](#)
- [Installing the DIMM, page 4-10](#)

Removing the DIMM

To remove the memory module, perform the following steps:

- Step 1** Determine the location of the memory sockets, see [Figure 6](#).

Figure 6 System Memory Location in the Cisco ASA 5505



1	DIMM
2	CompactFlash
3	Battery

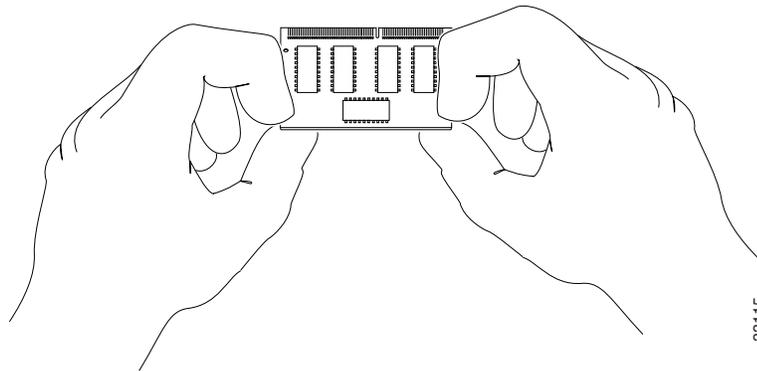
- Step 2** Locate the wrist grounding strap and connect one end to the adaptive security appliance, and securely attach the other to your wrist so it contacts your bare skin. See, “Working in an ESD Environment” for more information.



Note Handle the edges of the DIMM only; avoid touching the memory modules, pins, or traces (the metal fingers along the connector edge of the DIMM), along the connector edge.

To prevent ESD damage, handle DIMMs as shown in [Figure 7](#).

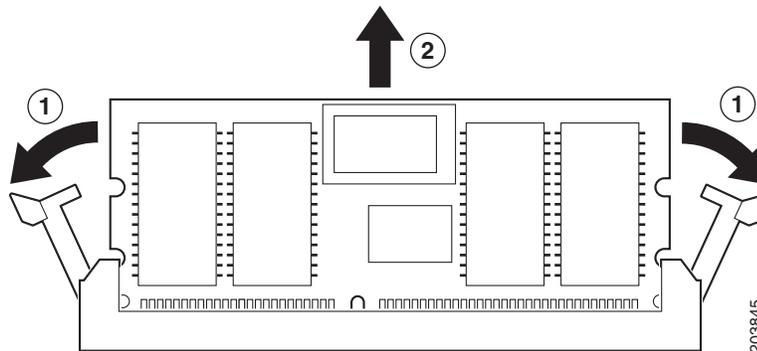
Figure 7 Handling a DIMM



- Step 3** Pull the latches away from the DIMM at both ends. See [Figure 8](#).

- Step 4** When both ends of the DIMM are released from the socket, grasp the ends of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket.

Figure 8 Releasing the DIMM Latches



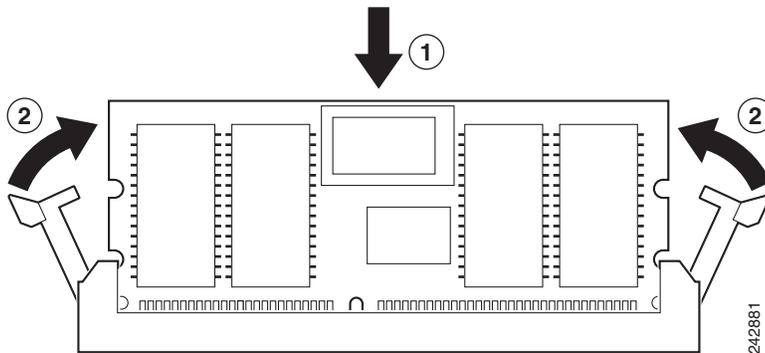
- Step 5** Place the DIMM in an antistatic container to protect it from ESD damage.

Installing the DIMM

To install the memory module, perform the following steps:

-
- Step 1** Make sure that both latches on the DIMM connector are open.
- Step 2** Remove a new DIMM from the antistatic container.
- The DIMM is designed in such a way that the connector will fit only one way.
- Step 3** Hold the DIMM component side up, with the connector edge away from you. Line up the notch in the connector traces with the notch in the socket on the board.
- Step 4** Carefully insert the connector edge into the socket and firmly press the DIMM into the socket until both latches rotate to the close position against the DIMM. See [Figure 9](#).

Figure 9 Inserting the DIMM



Caution

When inserting DIMMs, use firm but not excessive pressure. You can cause damage to the socket.

When you finish installing new memory, replace the chassis cover.

Verifying the Memory Upgrade

You can verify that the memory upgrade has been completed successfully by entering the **show version** command:

```
hostname# show version
```

```
Cisco Adaptive Security Appliance Software Version 8.0(0)
Device Manager Version 6.0(0)
```

```
Compiled on Mon 16-April-07 03:29 by root
System image file is "disk0:/cdisk.bin"
Config file at boot was "disk0:/main_backup.cfg"
```

```
hostname up 2 days 10 hours
failover cluster up 2 days 11 hours
```

```
Hardware: ASA5505, 512 MB RAM, CPU Pentium 4 Celeron 2000 MHz
BIOS Flash M50FW016 @ 0xffe00000, 2048KB
```




APPENDIX 1

Cable Pinouts

This appendix describes pinout information for 10/100/1000BaseT ports, console and the RJ-45 to DB-9 ports, and the Management 10/100/1000 Ethernet port, and includes the following sections:

- [10/100/1000BaseT Connectors, page 1-1](#)
- [Console Port \(RJ-45\), page 1-2](#)
- [RJ-45 to DB-9, page 1-4](#)
- [MGMT 10/100/1000 Ethernet Port, page 1-4](#)
- [Gigabit and Fibre Channel Ports, page 1-5](#)

10/100/1000BaseT Connectors

The adaptive security appliance supports 10/100/1000BaseT ports. You must use at least a Category 5 cable for 100/1000baseT operations, but a Category 3 cable can be used for 10BaseT operations.

The 10/100/1000BaseT ports use standard RJ-45 connectors and supports MDI and MDI-X connectors. Ethernet ports normally use MDI connectors and Ethernet ports on a hub normally use an MDI-X connector.

Use an Ethernet straight-through cable to connect an MDI to an MDI-X port. Use a cross-over cable to connect an MDI to an MDI port, or an MDI-X to an MDI-X port.

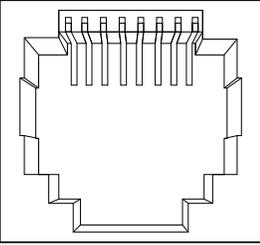
[Figure 1-1](#) shows the 10BaseT and the 100BaseTX connector (RJ-45).

Figure 1-1 10/100 Port Pinouts

Pin	Label	1 2 3 4 5 6 7 8
1	RD+	
2	RD-	
3	TD+	
4	NC	
5	NC	
6	TD-	
7	NC	
8	NC	

Figure 1-2 shows the 10BaseT, 100BaseTX, and 1000BASE-T connector (RJ-45).

Figure 1-2 10/100/1000 Port Pinouts

Pin	Label	1	2	3	4	5	6	7	8
1	TP0+								
2	TP0-								
3	TP1+								
4	TP2+								
5	TP2-								
6	TP1-								
7	TP3+								
8	TP3-								

Console Port (RJ-45)

Cisco products use the following types of RJ-45 cables:

- Straight-through
- Crossover

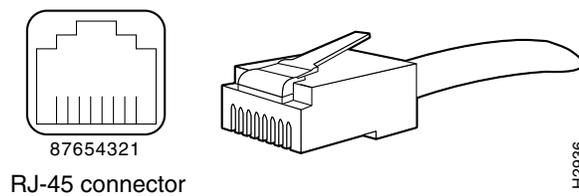


Note

Cisco does not provide these cables; they are widely available from other sources.

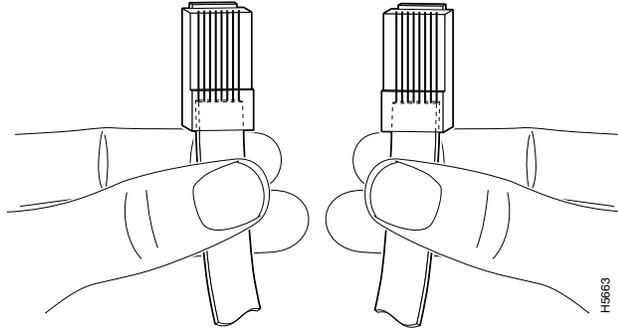
Figure 1-3 shows the RJ 45 cable.

Figure 1-3 RJ-45 Cable



To identify the RJ-45 cable type, hold the two ends of the cable next to each other so that you can see the colored wires inside the ends, as shown in [Figure 1-4](#).

Figure 1-4 *RJ-45 Cable Identification*



Examine the sequence of colored wires to determine the type of RJ-45 cable, as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Crossover—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.

[Table 1-1](#) lists the rolled (console) cable pinouts for RJ-45.

Table 1-1 *RJ-45 Rolled (Console) Cable Pinouts*

Signal	Pin	Pin	Pin
-	1	8	-
-	2	7	-
-	3	6	-
-	4	5	-
-	5	4	-
-	6	3	-
-	7	2	-
-	8	1	-

RJ-45 to DB-9

Table 1-2 lists the cable pinouts for RJ-45 to DB-9 or DB-25.

Table 1-2 Cable Pinouts for RJ-45 to DB-9 or DB-25

Signal	RJ-45 Pin	DB-9 Pin
RTS	8	8
DTR	7	6
TxD	6	2
GND	5	5
GND	4	5
RxD	3	3
DSR	2	4
CTS	1	7

MGMT 10/100/1000 Ethernet Port

The MGMT 10/100/1000 Ethernet port is an Ethernet port with an RJ-45 connector. You can use a modular, RJ-45, straight-through UTP cable to connect the management port to an external hub, switch, or router.

Table 1-3 lists the cable pinouts for 10/100/1000BASE-T Management Port Cable Pinouts (MDI).

Table 1-3 10/100/1000BASE-T Management Port Cable Pinouts (MDI)

Signal	Pin
TD+	1
TD-	2
RD+	3
RD-	6
Not used	4
Not used	5
Not used	7
Not used	8

Gigabit and Fibre Channel Ports

Table 1-4 lists the types of SFP modules and connectors used in the adaptive security appliance.

Table 1-4 *Types of SFP Modules and Connectors*

Port	Compliance	Connector	Fiber Type
Gigabit Ethernet	1000BASE-SX	SW	MMF
	1000BASE-LX	LW	SMF

Table 1-5 lists the SFP port cabling specifications for the SFP modules and connectors used in the adaptive security appliance.

Table 1-5 *SFP Port Cabling Specifications*

Cisco Product Number	Wavelength (nanometer)	Core Size (micron)	Baud Rate	Cable Distance
GLC-SX-MM=	850	62.5	1.0625	300 m
		50.0	1.0625	500 m
GLC-LH-SM=	1300	9.0	1.0625	10 km



INDEX

B

- battery [4-3](#)
 - remove [4-3](#)
 - replace [4-4](#)

C

- chassis
 - rack-mount [3-7](#)
 - rack mount tray [3-8](#)
 - security bracket [3-9](#)
 - wall-mount [3-5](#)
- chassis covers
 - removing [4-2](#)
 - replace [4-3](#)
- Cisco warranty [2-1](#)

D

- desktop cable lock [3-4](#)
 - install [3-4](#)

E

- electrostatic discharge
 - see ESD
- ESD
 - preventing [2-3, 4-1](#)

F

- failover [1-3](#)

- FIPS enclosure [3-11](#)
 - install [3-11](#)
 - tamper labels [3-12](#)
 - wall-mount [3-11](#)

I

- installing cables [3-1](#)
 - console port [3-3](#)
 - ethernet ports [3-2](#)

L

- LED
 - front panel LEDs [1-1](#)
 - LINK LED [3-2](#)
 - power LED [3-3](#)
 - rear panel LEDs [1-2](#)
 - SSC LEDs [4-5](#)

M

- memory [4-6](#)
 - DIMM [4-7](#)
 - DRAM memory [1-3](#)
 - flash memory [1-3](#)

P

- PoE [1-2, 3-2](#)
- power supplies
 - considerations [2-4](#)

R

RJ-45 connector
pinouts [1-4](#)

S

Security Services Card (SSC) [4-4](#)
install [4-5](#)
replace [4-6](#)
site environment [2-3](#)

W

Warning

AC Power [1-ix](#)
Blank Faceplates [1-viii](#)
Chassis [1-viii](#)
Circuit Breaker [1-ix](#)
Cover Panels [1-viii](#)
Ground Conductor [1-viii](#)
Grounded Equipment [1-x](#)
Instructions [1-vii](#)
Jewelry [1-vii](#)
Lightning [1-vii](#)
power Supply [1-vii](#)
Product Disposal [1-viii](#)
Rack-Mounting [1-viii](#)
SELV [1-viii](#)
Short-Circuit [1-viii, 1-ix](#)
TN Power [1-ix](#)
Wrist Strap [1-vii](#)